

SUPPLY AND TREND STUDIES

Physicians

Direct Patient Care Physician Supply

In September 1999 there were about 30,400 direct-patient-care (DPC) physicians practicing in Texas. The term includes both allopathic and osteopathic physicians but excludes physicians with a practice type of medical teaching, administration, research or “not-in-practice.” Both allopathic and osteopathic physicians are licensed by the Texas State Board of Medical Examiners (TSBME) to practice in Texas. DPC physicians provide direct patient care in one or more of 70+ “general” or “specialist” specialties recognized by the TSBME. Many DPC physicians have a secondary specialty as well. According to the TSBME licensure data for 1991 through 1999, the total DPC physician supply in Texas increased by an average of 685 physicians per year. If federal, resident and fellow DPC physicians are excluded from the physician supply totals as they are in many workforce studies, the annual increase averaged 654 new DPC physicians from 1991 through 1999.

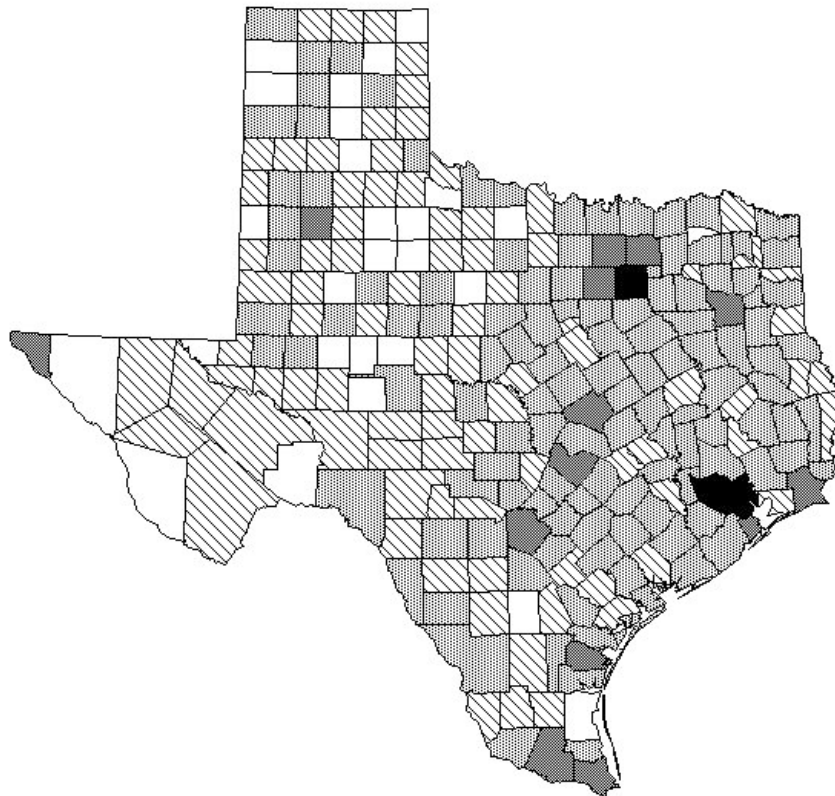
The HPRC uses DPC physician totals that include federal, resident and fellow physicians or DPC physician totals that exclude these providers. This is based upon reporting requirements from the U.S. DHHS Health Professional Shortage Area program that excludes these providers, or, analytical requirements from the U.S. DHHS that includes these types of physicians if using its IRM3.1 workforce model.

Primary Care Physician Supply

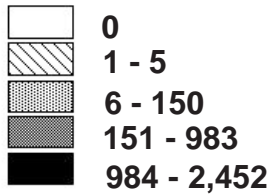
The term PC physician includes those physicians practicing in the five DPC specialties of family practice, general practice, general pediatrics, general internal medicine, and obstetrics-gynecology. The primary care specialties are a subset of the 70+ specialties included under the umbrella of DPC.

Of the 30,400 DPC physicians in Texas, 12,800 were PC physicians in 1999, an increase of 17 percent over the number practicing in Texas in 1994. Twenty-six of the state’s 254 counties had no PC physicians in 1999 and 20 counties had only one primary care physician. See Figure 2-1.

**Figure 2-1. Distribution of Primary Care Physicians
by County of Employment
Texas 1999**



Number of Primary Care Physicians



Prepared by:
Health Professions Resource Center
Office of Policy and Planning
Texas Department of Health

Data Source:
Texas State Board of Medical Examiners
September 20, 1999

The active, non-federal, non-resident/fellow PC physician supply increased by an average of 289 physicians per year from 1990 through 1999. Federal, resident and fellow physicians were excluded from the PC physician supply for those years. Although the state's population also increased during this time, the ratio of PC physicians per 100,000 population remained in the range of 57 to 66. Compared to a national benchmark ratio of 60 to 80, Texas remained in the lower range of the national benchmark, sometimes even dropping below the minimum benchmark value. The supply of PC physicians could be even more marginal since some of the physicians listed in the 1999 database practice only part-time. Others limit their practices to paying or insured patients or do not accept Medicaid patients. Thus, in some areas of the state the physician supply is probably less than simple supply ratios would seem to indicate.

The increase in the number of PC physicians, as well as the gains in other health care professionals, derives from several “educational pipelines” that train and deliver these providers to various health care settings such as hospitals, rural health clinics, and research facilities.

The State of Texas assists in the preparation of students for the health care professions by funding state colleges and universities where students receive the basic science education that qualifies them for entry into state-supported or private health professions training schools. Upon graduating from approved training schools, many graduates opt to remain in Texas either to practice or to receive advanced education and training. The exact number of physicians and other health care professionals who leave the state to practice elsewhere is unknown.

In 1999, 47 percent, or about 6,100 of the 12,900 PC physicians practicing in Texas, were trained in Texas schools (Table 2-1). Supplementing this pool of Texas medical graduates were 6,800 PC physicians who received their training from other states or other countries. This in-migrating PC physician supply pool is very significant to the health care delivery system in Texas. Out of those 6,800 non-Texas-trained physicians, 56 percent were trained in other countries and 44 percent were trained in out-of-state U.S. schools.

Losses occur when physicians move to other states or become inactive due to retirement, death, change in profession, or other situations. Although age, gender

Table 2-1. Primary Care Physicians by Location of Training, Texas, 1999.

Medical Schools/School of Osteopathic Medicine	Number of Physicians	Percent of Total
Baylor College of Medicine, Houston	737	5.7 %
Texas Tech University Health Science Center, Lubbock	357	2.8 %
Texas A&M University System, Health Science Center, College Station	136	1.1 %
University of North Texas Health Science Center, Fort Worth	562	4.4 %
University of Texas Medical Branch, Galveston	1,537	11.9 %
University of Texas Medical School, Houston	684	5.3 %
University of Texas Medical School, San Antonio	878	6.8 %
University of Texas Southwestern Medical School, Dallas	1,185	9.2 %
Total in State	6,076	47.2 %
Total Out of State or Out of Country	6,790	52.8 %
Grand Total	12,866	100.0 %

Source: Texas State Board of Medical Examiners, Master Licensing File, September 1999.

and race/ethnicity are important factors in workforce supply studies, little is known about how these variables actually affect the recruitment, retention, and attrition of providers. Most workforce models do not account for the effects of these factors on forecasts. Workforce planning and forecasting should not be based solely on the use of quantitative data since these and other variables may affect attrition rates. Thus, the inclusion of qualitative data concerning the workforce could yield better workforce plans and forecasts.

Race/Ethnicity of Primary Care Physicians

Race/ethnicity data for physician records received by the HPRC in 1999 from the TSBME were missing, so 1998 data were used for this statistic. In 1998, approximately two out of every three of the state's primary care physicians were White, non-Hispanic. See Table 2-2 and Figure 2-2. Of the remainder, 14 percent were Asian-Pacific Islander, 13 percent were Hispanic and four percent were Black.

The percentage of primary care physicians who were White, not Hispanic, fell from 76 percent in 1991 to 67 percent in 1998. The percentage of White, not Hispanic, physicians in the workforce in 1998 (67 percent) was about ten percent more than the percentage of this race/ethnic group in the general population (58 percent). Even though the minority populations in Texas between 1991 and 1998 increased in size, the physician workforce that was Black was about five percent less than the percentage of Blacks in the general population, and, the physician workforce that was Hispanic was about 16 percent less than the percentage of Hispanics in the general

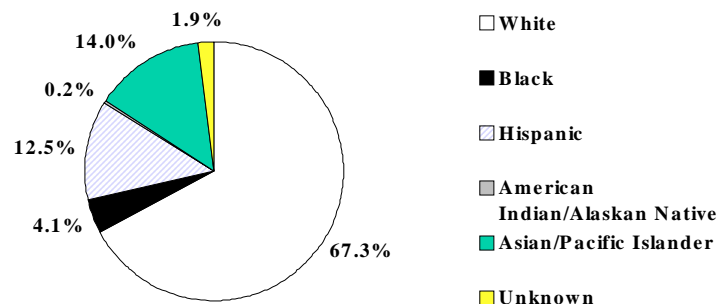
population. The largest proportionate gains in the minority physician workforce occurred with Asian-Pacific Islanders.

Table 2-2. Race and Ethnicity Trends for Primary Care Physicians, Texas, 1991 and 1998.

Race/Ethnicity of Primary Care Physicians	1991		1998	
	Primary Care Physicians	Texas Population	Primary Care Physicians	Texas Population
White	76.4 %	60.3 %	67.4 %	57.6 %
Black	3.3 %	11.7 %	4.1 %	11.6 %
Hispanic	9.8 %	25.8 %	12.5 %	28.3 %
Asian/Pacific Islander	8.8 %	2.2 %	14.0 %	2.5 %
American Indian/Alaskan Native	0.2 %		0.2 %	
Unknown	1.6 %		1.9 %	
Total	100.0 %	100.0 %	100.0 %	100.0 %

Source of Physician Data: Texas State Board of Medical Examiners, 1991 and 1998.

**Figure 2-2. Primary Care Physicians– Race/Ethnicity
Texas 1998**



Source: Texas State Board of Medical Examiners, 1999

In 1999, the projected population for Texas was almost 20 million. Fifteen percent of the population was located in 196 rural counties and 85 percent were located in the 58 urban counties. By comparison, 11 percent of the PC physicians were practicing in the rural areas of the state and 89 percent in the urban areas.

In 1999 there was one non-Federal, non-resident/fellow PC physician for every 1,562 persons statewide. However, this ratio varied considerably for rural and urban areas, physicians in rural areas typically have a larger patient base than physicians in urban areas. The population-to-PC physician ratio in rural areas was 2,125:1, approximately 43 percent higher than the urban ratio of 1,491:1 (Table 2-3). Calculating the provider and population data in terms of providers per 100,000 population, the overall state and urban ratios indicate a marginally adequate number of PC physicians, 64 and 67, respectively, per 100,000 population when compared to the national benchmark of 60 to 80. The rural areas fall below the national benchmark at 47 PC physicians per 100,000 population in 1999.

Table 2-3: Primary Care Physician Ratios for Urban and Rural Areas, Texas, 1999.

Location	Population	Population-per-Primary Care Physician	Primary Care Physicians per 100,000 population
Statewide	19,995,428	1,562 : 1	64
Urban	16,950,419	1,491 : 1	67
Rural	3,045,009	2,125 : 1	47

Source of Physician Data: Texas State Board of Medical Examiners, September 1999.

Source of Population Data: Texas State Data Center, Population Estimates & Projection Program, Texas A&M University.

Some rural counties are more successful than others in attracting physicians to work in their area. The shortage of physicians in rural areas has been partially alleviated through the use of non-physician providers, such as the use of physician assistants in the Big Bend area of Texas.

Gender Differences in Rural and Urban Counties

The composition of the PC physician workforce in Texas varies by gender among urban and rural areas. Three out of every four PC physicians were male in 1999. Gender statistics for 1999 were very similar to those in 1998. A 1998 report of the Council on Graduate Medical Education elaborated on similar findings:

Historically, rural medical care was almost exclusively provided by male physicians. This was a product of the paucity of women in medicine and the tendency of the few female graduates to locate in urban areas. As the proportion of women in medical schools has increased, there have been concerns that rural physician supplies might dwindle if women continued to settle almost exclusively in

urban areas. Recent work suggests that the problem may be growing less acute with time but that women still are much less likely to settle in rural areas. Although the Council on Graduate Medical Education's (COGME) 5th report concluded that "physician gender has little impact on workforce forecasting" the same cannot be said of geographic mal-distribution. Further research must be done in this area, and programs that support women who have the potential for practicing in underserved rural areas should be encouraged and supported.¹

The assertion that female physicians do not practice in rural areas as frequently as male physicians was confirmed for Texas. In 1999, 25 percent of the PC physicians practicing in urban areas were female, while only 14 percent of the PC physicians in rural areas were female. However, the proportion of female PC physician workforce has increased from about 16 percent in 1991 to 24 percent in 1999, indicating an increasing pool of potential recruits for rural areas. See Table 2-4.

Table 2-4. Percentage of Primary Care Physicians in Texas by Gender, 1999.

Gender	1991	1995	1999
Male	83.8 %	80.8 %	75.8 %
Female	16.2 %	19.2 %	24.2 %
Total	100.0 %	100.0 %	100.0 %

Source: Texas State Board of Medical Examiners, 1991, 1995, 1999.

Age Differences in Rural and Urban Counties

The average age of PC physicians in Texas was 49.7 years in 1999. The ages of PC physicians also differed based on whether the physicians were practicing in a rural or urban county. The average age for PC physicians in urban counties was 49.4 years and the average age in rural counties was 51.4 years. The higher attrition rates of aging rural providers could exacerbate the rural PC physician supply problem.

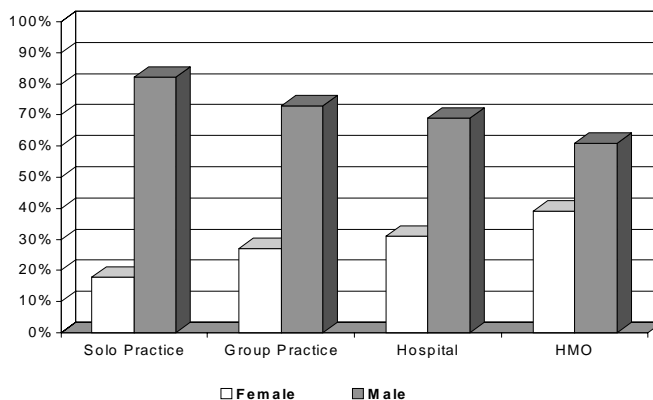
Practice Setting

Practice settings of active, non-federal, non-resident/fellow PC physicians changed only slightly between 1997 and 1999. In September 1999, 38 percent of the PC physician workforce were employed in solo practices, 51 percent were in partnership or group practices, nine percent were hospital based, and two percent were in HMOs. These statistics were in contrast to 1997 PC physician supply data where 40 percent

were employed in solo practice, 47 percent in partnership or group practice, 10 percent in hospitals, and less than one percent were in HMOs. A small percentage of PC physicians in 1999 did not give a practice setting type.

Female PC physicians in general appear to have different preferences for practice settings than their male colleagues (Figure 2-3). Female PC physicians are more likely to practice in HMO settings than their male peers. Since this could affect where physicians choose to practice, gender-related preferences for practice settings are important considerations when developing health care workforce plans. Although many physicians in solo, partnership, group, or hospital practice are also likely contractors with HMOs, this overlap cannot be ascertained from TSBME data since only one setting type may be selected on the renewal licensing form.

**Figure 2-3. Primary Care Physicians in Texas
By Practice Setting and Gender 1999**



Source: Texas State Board of Medical Examiners, September 1999.

Note: These were self-reported settings. Many physicians in solo, partnership, group, or hospital practice are also likely contractors with HMOs.

Primary Medical Specialty – Gender and Practice Location Differences

Physicians with family practice as their primary specialty comprise almost one-half (48 percent) of the rural physician supply (Table 2-5). This finding corroborates a recent COGME report that indicates that family practitioners are the only specialty group who are as likely to locate in rural areas as urban areas. Factors that may influence these practice decisions include the flexibility of scope of practice and

strong roots for family practice in rural areas. Many of the family practice educational programs reinforce these roots and traditions.^{1,2}

Table 2-5. Primary Care Physicians by Primary Specialty and Practice Location, Texas, 1999.

Physicians by Specialty	1999 Physician Total	% Urban	% Rural
Family Practice	3,772	29 %	48 %
General Practice	972	7 %	15 %
General Internal Medicine	3,981	30 %	22 %
General Pediatrics	2,167	18 %	8 %
Obstetrics & Gynecology	1,913	16 %	7 %
Total	12,805	100 %	100 %

Source of Physician Data: Texas State Board of Medical Examiners, September 1999.

According to the September 1999 TSBME licensure file, PC physicians also vary in their choice of primary medical specialty according to their gender. For example, a greater proportion of female physicians in Texas report pediatrics as their primary specialty than do males (Table 2-6).

Table 2-6. Primary Care Physicians by Primary Specialty and Gender, Texas, 1999.

Physicians by Specialty	1999 Physician Total	% Male	% Female
Family Practice	3,772	33 %	24 %
General Practice	972	10 %	5 %
General Internal Medicine	3,981	30 %	25 %
General Pediatrics	2,167	12 %	30 %
Obstetrics & Gynecology	1,913	15 %	16 %
Total	12,805	100 %	100 %

Source of Physician Data: Texas State Board of Medical Examiners, September 1999

Physician Specialty Mix

The ratio of the number of PC physicians licensed to practice in the five PC specialties to the number of DPC physicians licensed to practice in the remaining specialties is termed the “specialty mix” of generalists to specialists. Nationwide concern over specialty mix has become a major health workforce issue. This concern has resulted in the Council on Graduate Medical Education and the Physician Payment Review Commission to recommend a 50/50 specialty mix (generalist/specialist) goal for the nation by the year 2000. The Association of American Medical colleges, Pew Commission, Robert Wood Johnson Foundation, the American Academy of Family Physicians and others endorsed that goal. The goal was adopted for Texas by the 67th Texas Legislature.

An analysis of specialty mix information indicates that there has been little change in the ratio of PC physicians to DPC specialists in Texas. In 1991, the ratio was 44 percent PC physicians to 56 percent specialist physicians. In 1999, the ratio was 45 percent PC to 55 percent specialists.

Federal “Primary Medical Care”

Health Professional Shortage Areas (HPSAs)

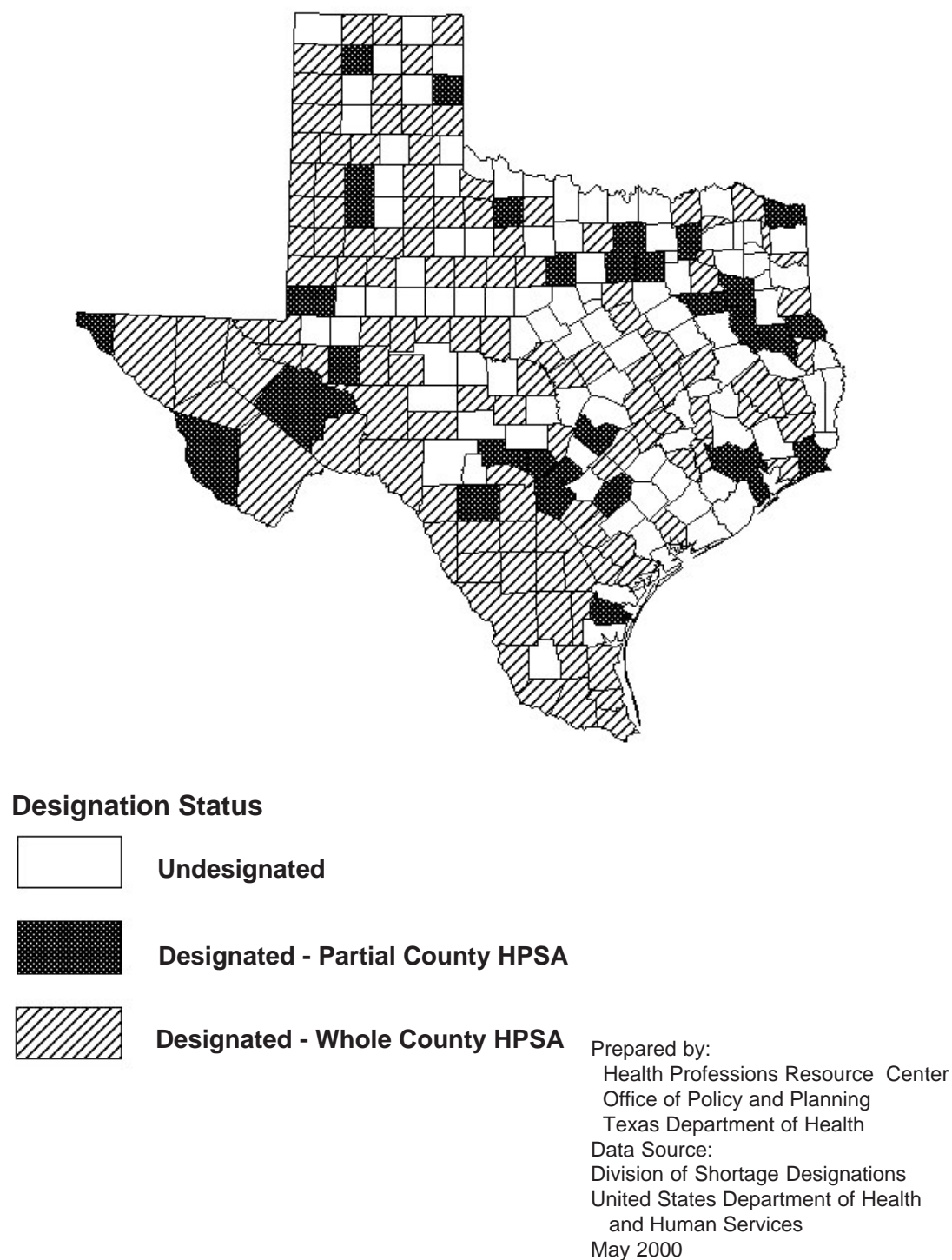
The U.S. Department of Health and Human Services (DHHS) HPSA designation program is administered in conjunction with the HPRC. The designation program uses population-to-PC physician ratios to identify counties having shortages of PC physicians. In June 1999, 58 percent of the counties in Texas (116 whole counties; 32 partial counties) had either whole or partial-county HPSA designations. Ninety-one percent of the 116 “whole county” HPSAs were rural counties. In addition to geographic area designations, the HPSA designation program also provides for the designation of special population groups within geographic areas and for the designation of facilities under certain circumstances.

It should be noted that many of these rural areas also experience shortages of non-physician PC providers including nurses, allied health professionals and mental health providers. Many of these underserved counties have programs that target the recruitment of physicians and non-physician practitioners to increase access to health care for people in their area. The location of these primary medical care HPSA areas is shown in Figure 2-4.

Non-Physician Primary Care Providers

“Non-physician primary care providers” refers to practitioners who deliver medical care directly to patients in a variety of health care settings, but who practice in a more limited scope of practice than physicians. Two non-physician provider types, the physician assistants (PAs) and nurse practitioners, are of major interest because of their increasing importance in health care provider teams employed in HMOs and in other practice settings, such as rural health clinics and school-based clinics. In these settings, they collaborate with physicians in medical practice, providing services in certain practice functions sanctioned by the Texas Medical Practice Act and the Nurse Practice Act. Because they are important to the delivery of health care in Texas, their workforce supply requirements, along with the requirements for physicians, are considerations in workforce planning.

**Figure 2-4. Federally Designated Primary Care
Health Professional Shortage Areas in Texas
2000**



Physician Assistants

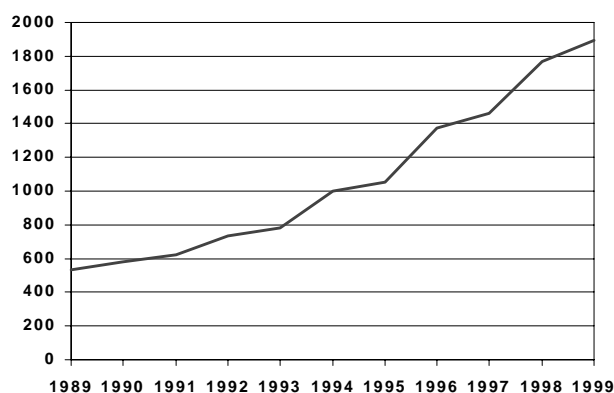
The steadily increasing number of PAs practicing in Texas could be due to their expanding role in the provision of primary care as a result of modifications in the Medical Practice Act. However, other factors could also promote the increase in the use of these non-physician providers, such as the high cost of compensation for physicians and the accepted use of these practitioners in HMO practice environments, rural health clinics and school-based clinics.

Physician Assistant Supply

According to the 1999 TSBME licensure data, there were 1,893 PAs licensed to practice in Texas. Not all PAs were practicing in primary care areas. Examples of non-primary care practice areas include: emergency medicine, general surgery, pediatric sub-specialties, surgical sub-specialties, and internal medicine sub-specialties. Licensure data collected on PAs in Texas do not include specialty data. National survey statistics were used to estimate the distribution of PAs in Texas by specialty for use with the Integrated Requirements Model reported upon later in this chapter.³

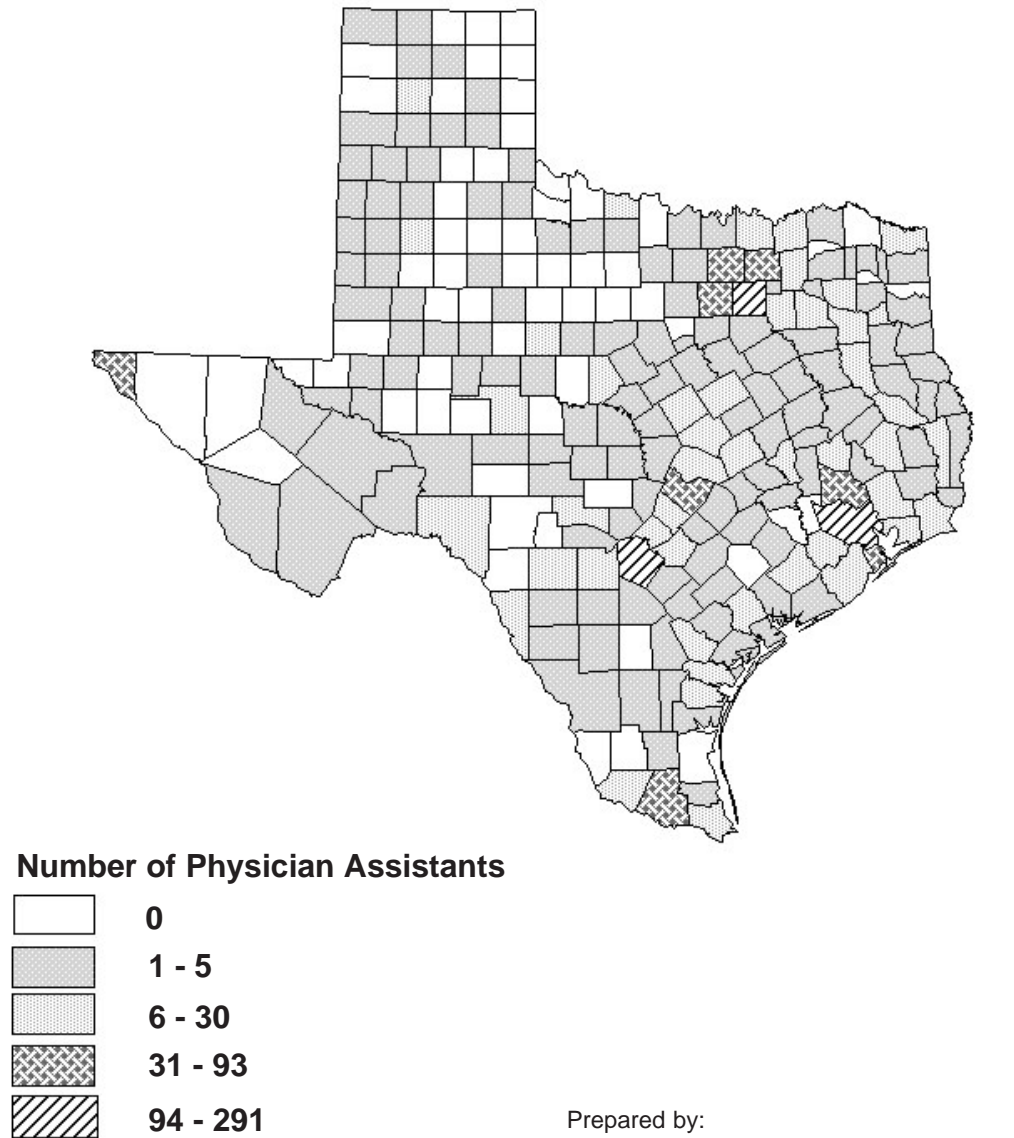
The number of PAs practicing in Texas has greatly increased over the past years. PA totals increased from 571 in January 1989 to 1,893 in September 1999 (Figure 2-5). Out of the total licensed PAs, 20 percent did not indicate a practice address on

**Figure 2-5. Physician Assistants
Texas, 1989-1998**



Source: Texas State Board of Medical Examiners, September 17, 1999.

**Figure 2-6. Distribution of Physician Assistants
by County of Employment
Texas 1999**



Prepared by:
Health Professions Resource Center
Office of Policy and Planning
Texas Department of Health
Data Source:
Texas State Board of Medical Examiners
September 17, 1999

their license application or renewal form. Thus, for statistical and mapping purposes, the mailing address was used as a proxy for the missing practice location. Figure 2-6 shows the distribution of PAs in Texas based on their practice addresses.

Race/Ethnicity, age and Gender of Physician Assistants

The race/ethnicity of the majority of the PAs in Texas during 1999 was white. The next most prevalent group were the Hispanic PAs. Male PAs only slightly outnumbered female PAs (Table 2-7).

Table 2-7. Distribution of Physician Assistants by Gender and Race/Ethnicity, Texas, 1999.

Characteristic	Variable	Percent*
Gender	Male	52 %
	Female	47 %
	Gender not provided	< 1 %
	Total	100 %
Race / Ethnicity	White, not Hispanic	78 %
	Black	5 %
	Hispanic	10 %
	Asian-Pacific Islander	3 %
	American Indian – Alaska Native	< 1 %
	Ethnicity not provided	4 %
	Total	100 %

Source: Texas State Board of Medical Examiners, September 1999.

The average age of PAs in Texas was 41.5 years (see Table 2-8). As with other professional types, rural PAs are generally older than their urban counterparts. The average age of PAs in rural counties was 44.2 years in 1999. And, the average age of PAs in urban areas was 40.9 years.

Table 2-8. Distribution of Physician Assistants by Age, Texas, 1999.

Characteristic	Variable	Percent*
Age	< 40 years	43 %
	40 to 49 years	36 %
	50 to 59 years	19 %
	60 to 69 years	2 %
	> 70 years	< 1 %
	Total	100 %

Source: Texas State Board of Medical Examiners, September 1999.

A noteworthy disparity in age and gender exists among PAs based on their practice location - nearly 28 percent of the PAs in urban counties were female but only 12

percent in rural areas were female. Four out of every five PAs (79.6 percent) practiced in urban counties in 1999.

Registered Nurses (RNs)

RN Supply

According to the Texas Board of Nurse Examiners (TBNE) 1999 licensure data, there were 182,594 active RNs practicing in Texas. This total also included federal nurses and nurses employed full-time in nursing (58 percent), part-time in nursing (ten percent), in occupations other than nursing (three percent), and were either unemployed, retired or inactive (29 percent).

With the exclusion of the federal nurses, 118,929 RNs were actively employed in the field of nursing in Texas during 1999, a ratio of 595 RNs per 100,000 population. The state ratio was considerably lower than the ratio at the national level. For example, in 1997 the ratio was 772 RNs per 100,000 population; and, in 1996 the national ratio was 749 per 100,000 population.

Age and Gender of Registered Nurses in Texas – Urban and Rural differences

In 1999 the nursing population in Texas was predominantly female, only eight percent of the nurses being male. The proportion of female to male nurses in rural counties (92.1 percent) was similar to the proportion in urban counties (91.7 percent). Only ten percent of all Texas nurses were located in rural areas.

The average age for RNs in Texas was 45.6 years. Rural nurses were slightly older than urban nurses - the average age for nurses in urban counties was 45 years; and, in rural areas, the average age was 46 years. A recent issue of the Journal of the American Medical Association (JAMA) indicated that the average age of working RNs increased by 4.5 years between 1983 and 1998.⁴ They expect to see the aging of the RN workforce to continue:

Over the next two decades, this trend will lead to a further aging of the RN workforce because the largest cohorts of RNs will be between age 50 and 69 years. Within the next ten years, the average age of RNs is forecast to be 45.4 years, an increase of 3.5 years over the current age, with 40 percent of the RN workforce expected to be older than 50 years. The number of full-time equivalent RNs per capita is forecast to peak around the year 2007 and decline thereafter as the largest cohorts of

RNs retire. By the year 2020, the RN workforce is forecast to be roughly the same size as it is today, declining nearly 20 percent below projected RN workforce requirements.

Another recent report, *Health and Nurses in Texas –The Supply of Registered Nurses: First Look at Available Data*,⁵ indicates that the age of the RN workforce in Texas is increasing, wages are stagnating, and RNs are withdrawing in increasingly larger numbers from the active workforce. Without some type of intervention, the RN shortage will increase over the next decade in Texas.

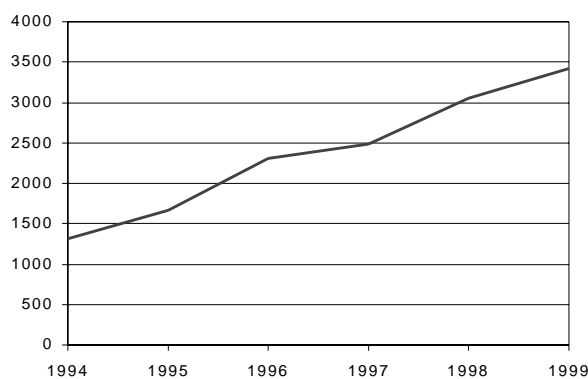
Advanced Practice Nurses (APNs)

The term APN includes all nurses recognized by the TSBNE as nurse practitioners (NP), nurse midwives (NM), nurse anesthetists (NA), and clinical nurse specialists (CNS). The APN specialties are based on the types of practice or target populations of the practice, such as pediatrics, family, school health, women's health, oncology, and psychiatric/mental health.

Nurse Practitioner Supply

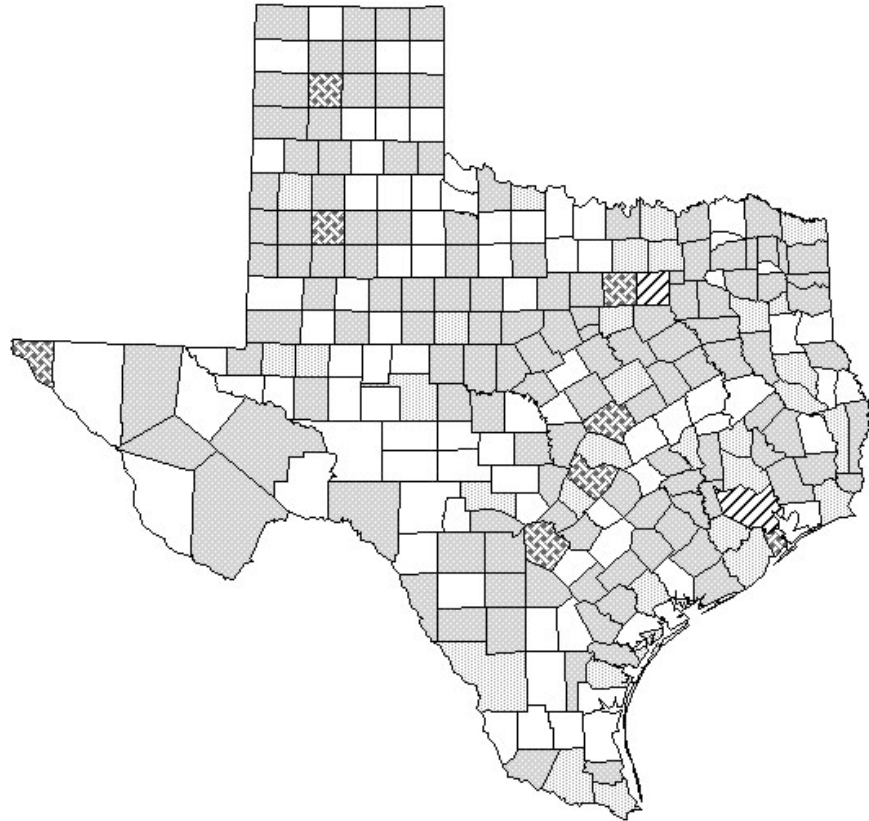
In 1999, there were 3,363 active NPs practicing in Texas (Figure 2-7). The importance of NPs in the delivery of health care is indicated by their steady increase in supply over the past five years, from 1,314 in 1994 to 3,363 in 1999 (Figure 2-8).

**Figure 2-8. Historical Supply of Nurse Practitioners
Texas, 1994-1999**

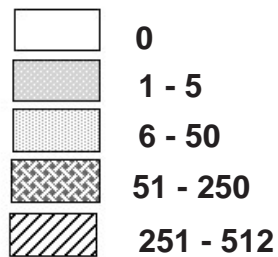


Source: Texas Board of Nurse Examiners, Sept. 2, 1999 website file.
Includes all RNs recognized as Nurse Practitioners in the
APN master file, excluding only out-of-state RNs.

**Figure 2-7. Distribution of Nurse Practitioners
by County of Employment
Texas 1999**

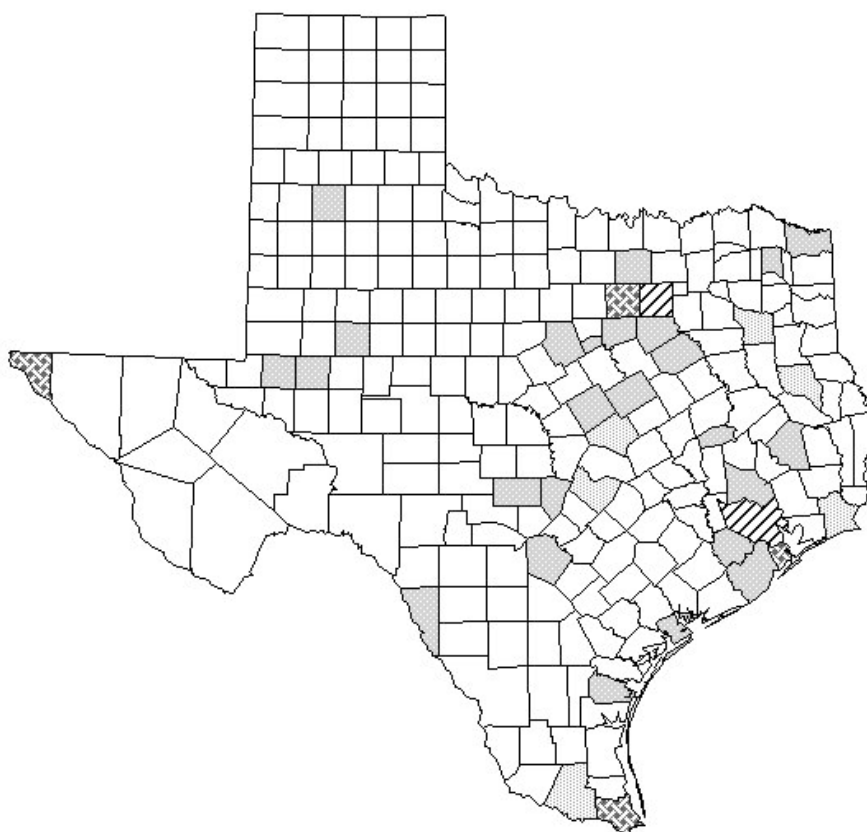


Number of Nurse Practitioners

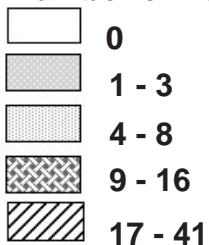


Prepared by:
Health Professions Resource Center
Office of Policy and Planning
Texas Department of Health
Data Source:
Texas Board of Nurse Examiners
September 17, 1999

**Figure 2-9. Distribution of Nurse Midwives
by County of Employment
Texas 1999**



Number of Nurse Midwives

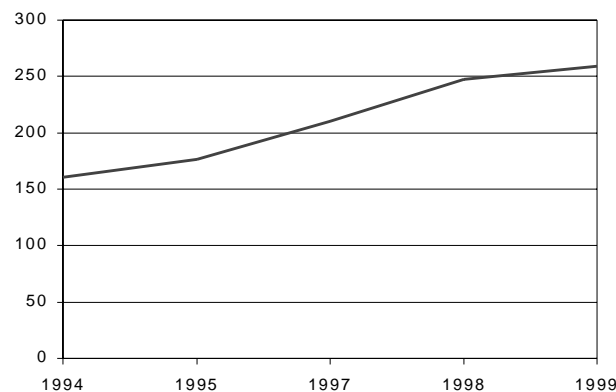


Prepared by:
Health Professions Resource Center
Office of Policy and Planning
Texas Department of Health
Data Source:
Texas State Board of Nurse Examiners

Nurse Midwife Supply

Nurse midwives are primarily located in the urban areas of Texas (Figure 2-9). They have gradually increased in number over the last five years. In 1994 the number of active nurse midwives was 161. By 1999 that number had increased to 259 (see Figure 2-10).

**Figure 2-10. Certified Nurse Midwives
Texas, 1994-1999**



Source: Texas Board of Nurse Examiners, September 17, 1999.

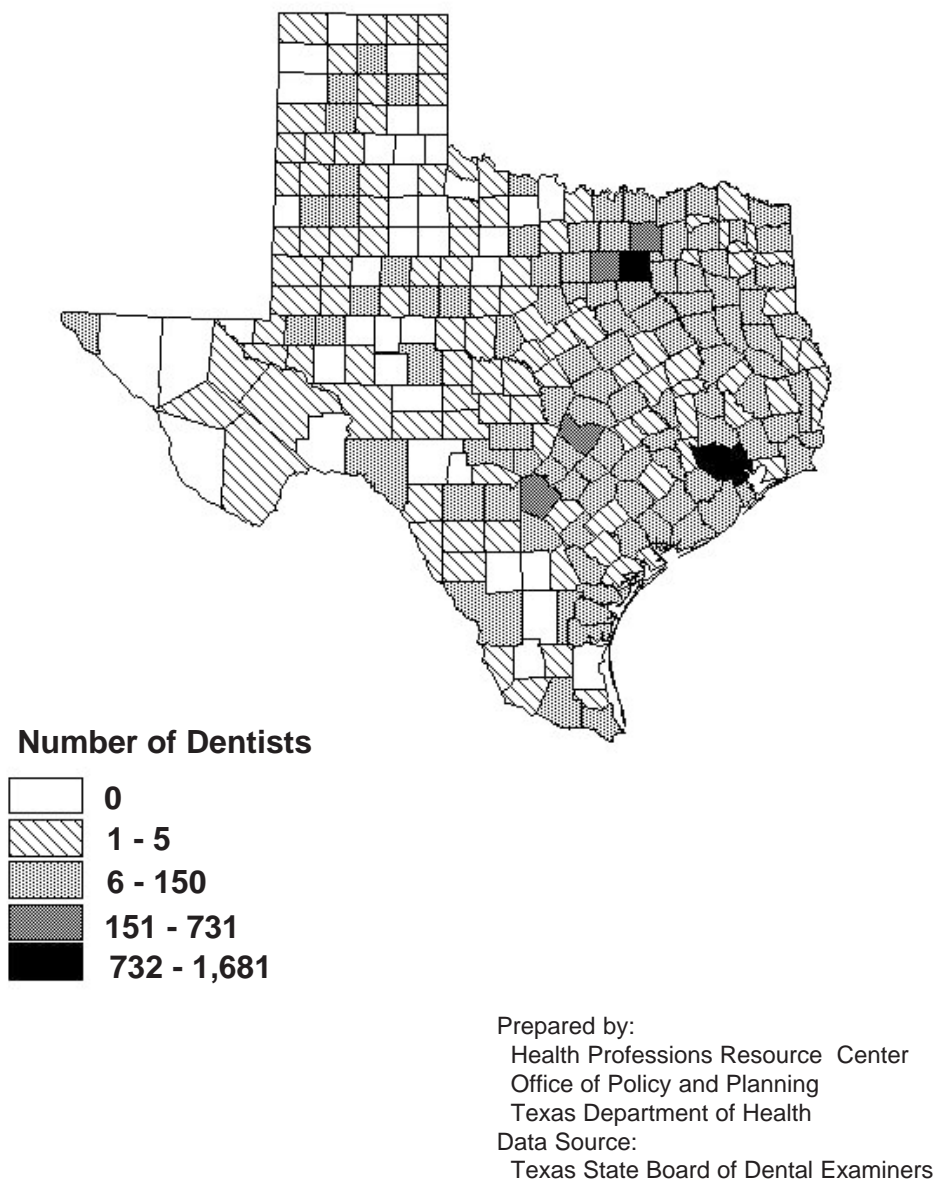
Dentists

The dentists described in this chapter are those considered by the U.S. DHHS as “dental generalists.” This term denotes dentists with the following practice types: general dentistry, pediatric dentistry, and dental public health. The term excludes the following “specialist” practice types: endodontics, oral and maxillofacial surgery, oral pathology, orthodontics, periodontics and prosthodontics. Only active Texas dentists were included in the analyses. Dentists with the following practice descriptions were excluded: retired, faculty, military exempt, government, or resident.

Dentist Supply

In 1999, 8,109 out of a total of 15,193 dentists were non-federal general dentists in private practice. These dentists were evaluated for supply and demographic characteristics. See Figure 2-11.

**Figure 2-11. Distribution of Dentists
by County of Residence**



Dentist Practice Location

Most of the 8,109 general dentists (89 percent) were employed in urban areas. The patient base for dentists varied considerably between urban and rural practice locations. In 1999, the population-per-dentist ratio for the state as a whole was 3,832:1; however, in urban areas the ratio was 2,341:1. In rural areas, the ratio was 4,648:1 (Table 2-9).

Table 2-9. Population-per-Dentist Ratios for Urban and Rural Areas in Texas, 1999

Location	Population-to-Dentist Ratio
Statewide	3,832:1
Urban	2,341:1
Rural	4,648:1

Source of Dentist Data: Texas State Board of Dental Examiners, 1999.

Source of Population Data: Texas State Data Center, Population Estimates and Projection Program, Texas A&M University.

Age and Gender of Dentists in Rural vs Urban Counties

The number of male dentists greatly exceeded the number of female dentists in 1999. Only 18 percent of the dentists statewide were female (Table 2-10). An even greater disparity exists in rural areas where female dentists comprise only seven percent of the dental workforce. In urban areas they comprise 20 percent of the dental workforce. Over 60 percent of the dentists statewide were below the age of 50 years (Table 2-10), the average age being 47.6 years.

Table 2-10. Distribution of Dentists by Age and by Gender, Texas, 1999.

Characteristic	Age Range/Gender	Percent
Age	Unknown	< 1.0 %
	25 to 39 years	24.9 %
	40 to 49 years	35.7 %
	50 to 59 years	23.1 %
	60 to 69 years	10.4 %
	70 + years	4.9 %
	Age Total	100.0 %
Gender	Male	81.7 %
	Female	18.3 %
	Gender Total	100.0 %

Source of Dentist Data: Texas State Board of Dental Examiners, 1999.

Federal Dental Health Professional Shortage Areas (HPSAs)

The U.S. DHHS HPSA designation program uses population-to-general dentist ratios to identify counties with a shortage of dentists. In addition to geographic area designations, the HPSA designation program also provides for the designation of special population groups within geographic areas and for the designation of facilities under certain circumstances.

In 1999, 86 counties in Texas were designated by the U.S. Department of Health and Human Services as experiencing a shortage of dentists. Seventy-one of these designations were for whole counties. (Figure 2-12)

Psychiatrists

There were 1,351 psychiatrists licensed by the Texas State Board of Medical Examiners (TSBME) in September 1999 (see Figure 2-13). In addition to physicians practicing in the specialty of psychiatry, physicians in the specialties of child psychiatry and psychoanalysis were also included in this report as “psychiatrists” to comply with the HPSA definition of “general” psychiatry.

Mental Health - Health Professional Shortage Areas

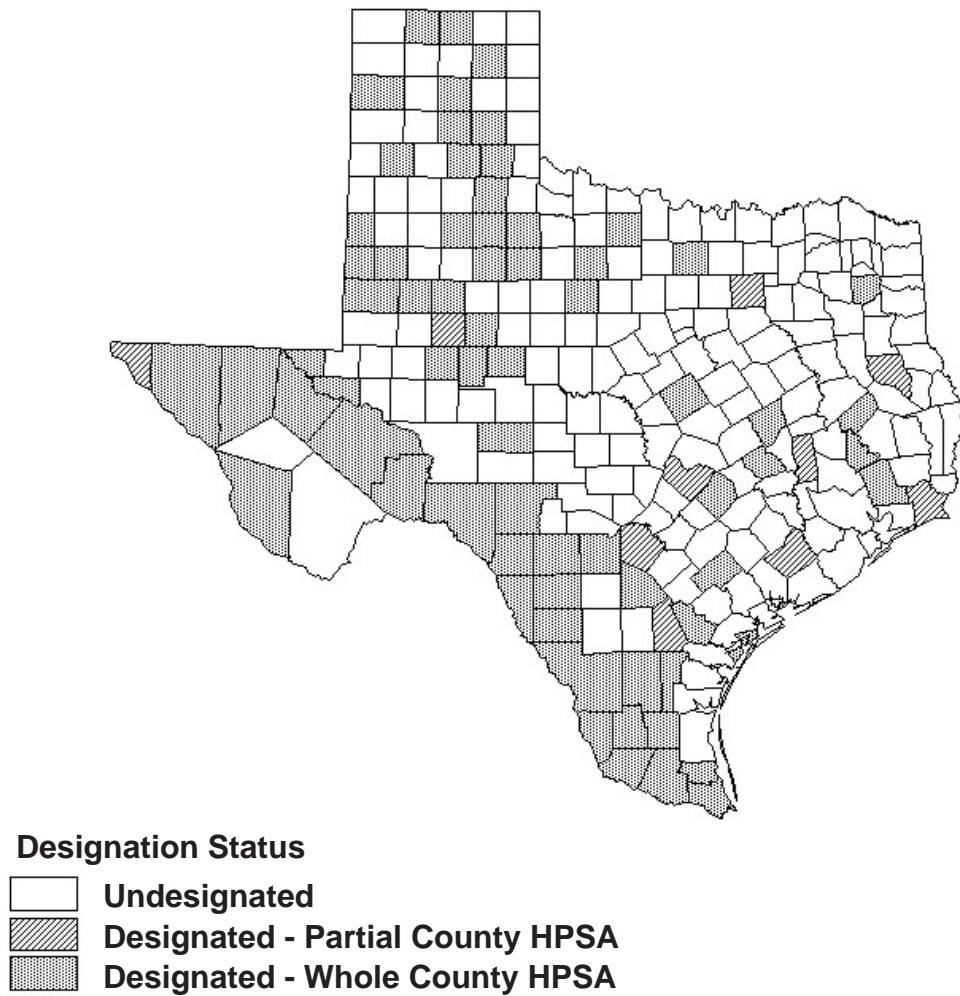
In 1999, 192 counties in Texas were designated by the U.S. DHHS as mental health HPSAs (Figure 2-14). In general, few psychiatrists practiced in rural areas of the state. The population-to-psychiatrist ratio was 13,305:1 in urban areas of Texas. In rural areas, this ratio was 39,546:1, almost three times greater than in the urban areas (Table 2-11).

Table 2-11. Population-to-Psychiatrist Ratios for Urban and Rural Areas, Texas, 1999.

Location	Population-to-Psychiatrist Ratio
Statewide	14,800 : 1
Urban	13,305 : 1
Rural	39,546 : 1

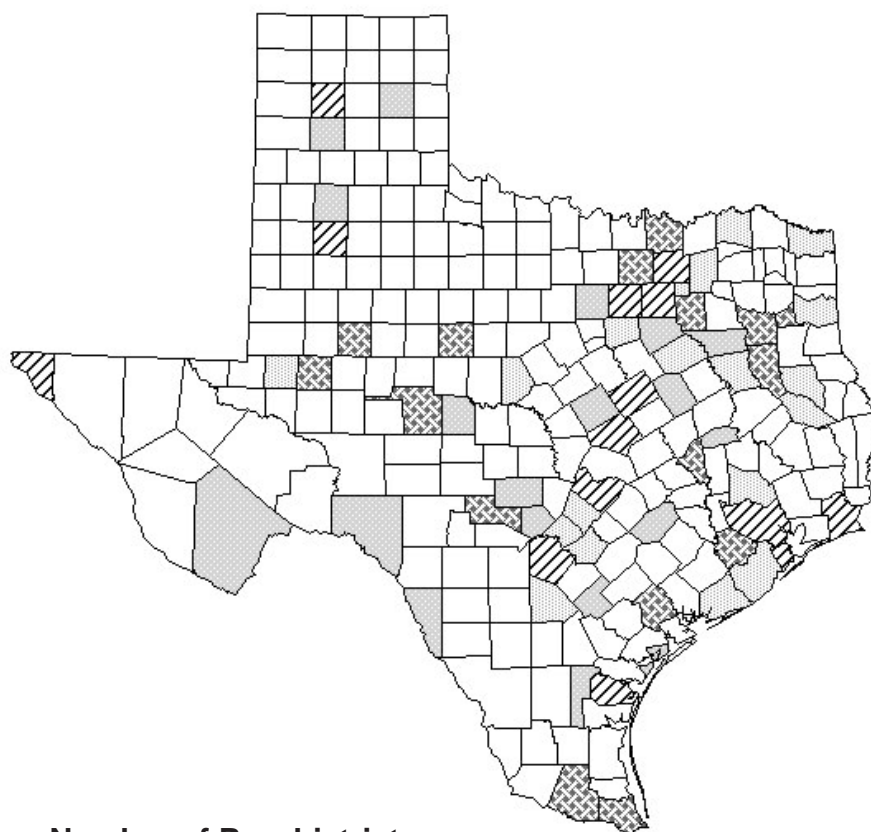
Source: Texas State Board of Medical Examiners, September 1999.
Source of Population Data: Texas State Data Center, Population
Estimates & Projection Program, Texas A&M University.

**Figure 2-12. Dental Health Professional Shortage Areas
Texas 1999**

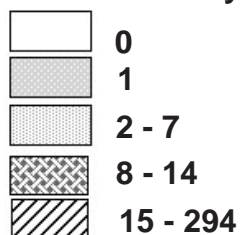


Prepared by:
Health Professions Resource Center
Office of Policy and Planning
Texas Department of Health
Data Source:
Division of Shortage Designation
United States Department of Health
and Human Services
April 20, 1999

**Figure 2-13. Distribution of Psychiatrists
by County of Employment
Texas 1999**

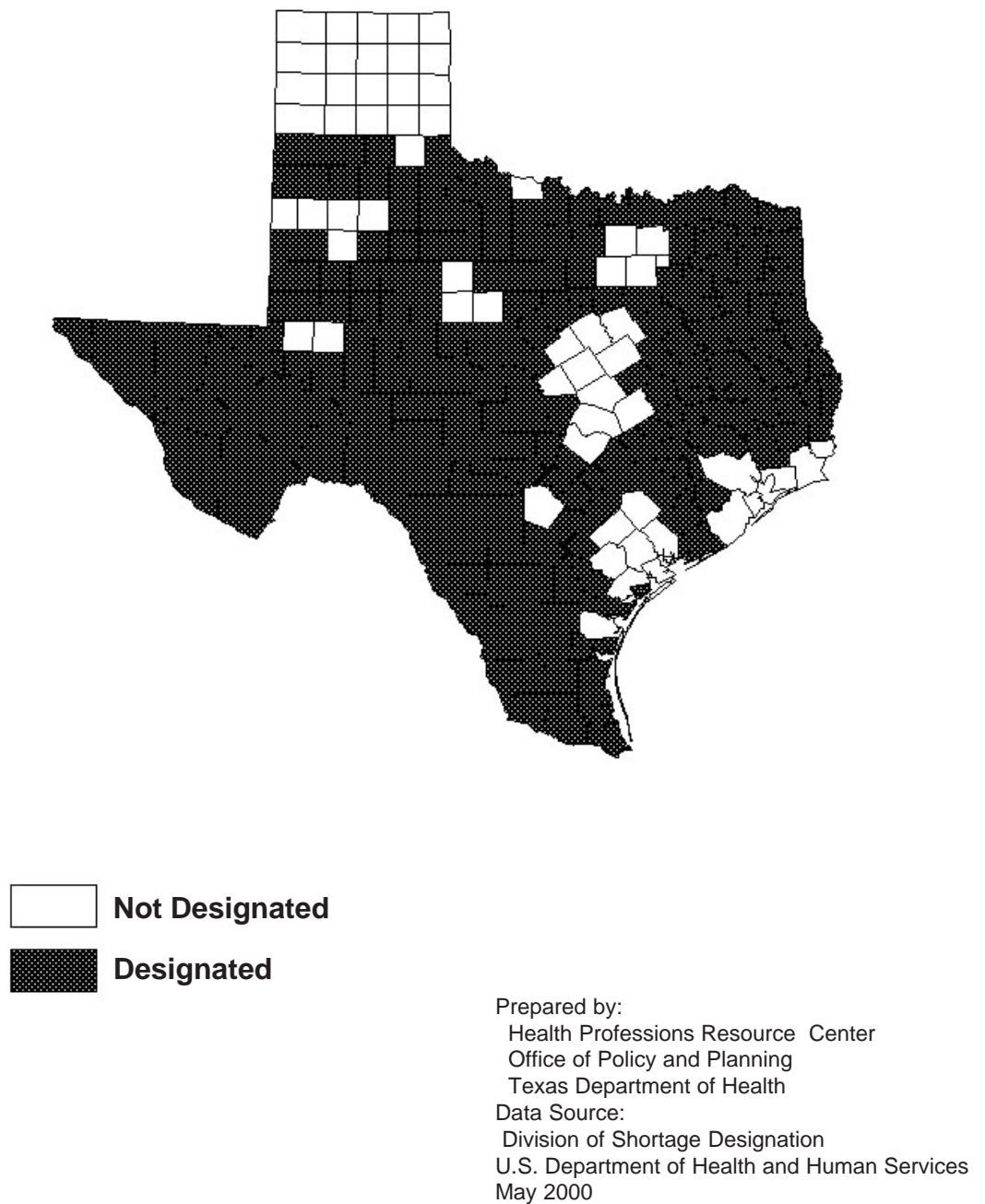


Number of Psychiatrists



Prepared by:
Health Professions Resource Center
Office of Policy and Planning
Texas Department of Health
Data Source:
Texas State Board of Medical Examiners
September 20, 1999

**Figure 2-14. Federally Designated Mental Health
Health Professional Shortage Areas
Texas 2000**



Federal Mental Health, Health Professional Shortage Areas (HPSAs)

The U.S. DHHS HPSA designation program uses population-to-psychiatrist ratios to identify counties with a shortage of psychiatrists. In addition to geographic area designations, the HPSA designation program also provides for the designation of special population groups within geographic areas and for the designation of facilities under certain circumstances.

In 1999, there were 192 mental health HPSAs in Texas that were designated by the U.S. Department of Health and Human Services. (Figure 2-14)

Age and Gender of Psychiatrists

Nearly three out of every four (73 percent) of Texas' psychiatrists were male in 1999; and, slightly more than one-half (51 percent) were over 50 years of age (Table 2-12).

Table 2-12. Distribution of Psychiatrists by Age and Gender, Texas, 1999.

Characteristic	Variable	Percent
Age	< 40 years	13.2 %
	40 to 49 years	31.9 %
	50 to 59 years	28.6 %
	60 to 69 years	17.9 %
	> 70 years	8.4 %
	Age Total	100.0 %
Gender	Male	72.8 %
	Female	27.2 %
	Gender Total	100.0 %

* Percent of the column total for each characteristic.

Source: Texas State Board of Medical Examiners, September 1999.

Psychologists

The Texas State Board of Examiners of Psychologists (TSBEP) issues four types of licenses to psychologists each of which has different requirements.

- Licensed Psychologist (LP)
- Provisionally Licensed Psychologist (PLP)
- Licensed Psychological Associate (LPA)
- Licensed Specialist in School Psychology (LSSP)

Psychologist Supply - 1999

Since psychologists are included in determining a Mental Health Professional Shortage Area designation, their supply and demographics were also evaluated for this report. However, only their numbers and location (urban, rural) were available for analysis in 1999 because the TSBEP is one of only a few boards that does not collect age, gender and race/ethnicity on its licensees. Licensed psychologists were in greatest supply in 1999 (see Table 2-13).

Table 2-13. Supply and Population-to-Psychologist Ratio in Texas, 1999.

Psychologist Type	Number	Population-to-Psychologist Ratio
LP	3,011	6,641:1
PLP	152	131,549:1
LPA	1,418	14,101:1
LSSP	1,639	12,200:1

Source: Texas State Board of Examiners of Psychologists, September 1999.

Licensed Social Workers

The Texas State Board of Social Worker Examiners (TSBSWE) issues licenses to social workers in Texas. In 1999, there were 14,782 social workers practicing in Texas, a population to social worker ratio of 1,353:1. This supply total is a large increase over the number of social workers since the early 1990s. For example, in 1993 there were 6,783 social workers, a ratio of 2,658:1. Age, gender and race/ethnicity were not available from the TSBSWE.

Workforce Requirements Analysis

The Statewide Health Coordinating Council and the Health Professions Resource Center (HPRC) are charged to monitor and determine if Texas has enough physicians and non-physician providers to adequately staff its health care delivery system, now and in the future. This section of the State Health Plan Update describes efforts to better understand Texas' future requirements.

Matching future supply with future requirements is a major emphasis of health care workforce modeling. Supply is defined as the number and type of health care personnel needed to staff, or available to staff, the current or future health care delivery system. Requirements is the number and type of personnel needed to provide a specified quantity and quality of care to a population. A balance between the two is necessary before other problems such as distribution and access can be adequately addressed. The supply and requirements for health care providers depends in part

on population growth and composition, insurance coverage, geographic location (urban, rural), and provider staffing and utilization patterns under various insurance coverage systems.⁶

Integrated Requirements Model (IRM3.1)

The IRM3.1 model focuses on how different provider types provide medical care to populations covered by private and public insurance payment systems, such as managed care and Medicaid programs. Since the routes along which the future health care delivery system will develop are unknown, a range of potential delivery systems was investigated. This was accomplished by using two insurance coverage scenarios that are included in the IRM and a Texas specific scenario that was developed at the HPRC. The two IRM scenarios are the Status Quo (SQ) and High Managed Care (HMC) scenarios. The requirements estimated under these scenarios are based on U.S.-level insurance and staffing pattern data. The results obtained with them indicate the number of providers required in Texas if Texas had insurance and staffing patterns similar to the national standard for 1995. A Texas (TX) scenario was developed that was based on Texas population projections from the Texas State Data Center and Texas insurance coverage data obtained from several state or federal sources (see Exhibit 2-1). The IRM bases its projections of requirements for health professionals by assigning substitution rates to certain non-physician providers. The assumption is that the services these professionals provide can “substitute” for a certain amount of physician time. Substitution rates used in this analysis were obtained from the Texas Medical Association.

The SQ scenario operates under the assumption that health insurance coverage and staffing ratios of providers (per 100,000 population) will be the same in 2006 as what they were at the national level in 1995. The only variables to change in this scenario are the growth and aging of the Texas population (using the U.S. Bureau of the Census population data for Texas).

The HMC scenario evaluates the effect of increasing the level of HMO penetration among populations for the year 2006. This scenario assumes that Medicare will promote HMO enrollment among its beneficiaries, states will shift their Medicaid populations into HMO settings, and HMOs will enroll more private sector patients. Under the HMC scenario the percentage of the population covered by HMOs increases by almost 13 percent over the percentage of the population covered by HMOs under

the SQ scenario. The population affected the most by this increase in coverage by HMOs is the fee-for-service population.

The TX Scenario is a “modified Status Quo scenario” in that it assumes that the current (mostly 1999 data) insurance coverage rates for people in Texas and the non-physician provider substitution rates for 1999 will remain in effect through 2006. The growth and aging of the Texas population are expected to follow the Texas State Data Center’s scenario 1.0 projection.

Workforce Modeling Results

Primary Care - Year 2006 Requirements

All professional types that were analyzed by the IRM3.1 were categorized by their roles in providing patient care in one of the 18 physician specialties included in the model.

The physician specialties evaluated in this report were primary care physicians which includes general practice, family practice, general pediatrics, general internal medicine, and obstetrics and gynecology. The other physician specialty analyzed was psychiatry.

Although the non-physician professions analyzed in this study do not have specialties as such, many do provide patient care in practice settings that often correlate with one of the 18 physician specialty types. A list of the physician specialty areas analyzed in this report, and the types of non-physician providers who may partially substitute for physicians in each specialty are shown in Table 2-14.

Overall, the number of PC physicians required to provide medical care for the Texas population and to function effectively in the health care delivery system varied slightly among the three scenarios. The requirement for PC physicians in 2006 exceeds the projected supply by only several hundred physicians. See Table 2-15.

The total number of PC physicians should be adequate to manage the primary care needs of the state as a whole. However, distribution across the state will continue to be a problem. For example, it appears that Texas could have a small oversupply of family and general practice physicians but a shortage of general internal medicine physicians. The other primary care specialties will be just about right for Texas.

Table 2-14. Sorting of Patient Care Providers According to Physician Specialty.

Physician Specialty	Non-Physician Provider Types	
General Internal Medicine	Acupuncturist Chiropractor Naturopath	Nurse Practitioner Physician Physician Assistant
General Pediatrics	Nurse Practitioner Physician	Physician Assistant
General/Family Medicine	Acupuncturist Chiropractor Naturopath	Nurse Practitioner Physician Physician Assistant
Obstetrics and Gynecology	Acupuncturist Nurse Midwife Nurse Practitioner	Physician Physician Assistant
Psychiatry	Clinical Nurse Specialist Physician - Psychiatrist	Psychologist Social Worker

Source: Health Professions Resource Center, 1999.

Table 2-15. Comparison of Year 2006 Physician IRM3.1 Requirements and Supply Projections for Selected Physician Specialties using Historical Licensing Board Data.

Provider Type	IRM3.1 Scenarios 2006			TX Projected Supply from Trend Data
	SQ*	HMC	TX	
Primary Care				
Primary Care Total	24,383	24,314	25,115	24,629
Family & General Practice	7,436	7,419	7,307	8,580
Obstetrics & Gynecology	3,313	3,302	3,246	3,341
General Internal Medicine	9,257	9,239	10,256	8,277
General Pediatrics	4,377	4,354	4,306	4,431
Mental Health				
Psychiatry	3,225	2,980	5,242	2,604

Source: Health Professions Resource Center, 1999.

*SQ = Status Quo scenario; HMC = High Managed Care scenario; TX = Texas scenario

Psychiatry - Year 2006 Requirements

The results for physicians with a psychiatry specialty were not as clear as the PC physicians. According to the TX Scenario, there will be an unmet demand for physicians in this specialty in 2006. Whether this unmet demand can be resolved through the use of non-physician providers is unclear. When the SQ and the HMC scenarios are compared to supply projections for 2006, it appears that Texas will have an appropriate number of psychiatrists to serve the state. Because of the discrepancy between IRM SQ and HMC scenarios and the TX Scenario, these results need to be followed closely over the next several years to see which results prove to be the most accurate.

Forecasting supply appears simple, but it is influenced by many factors. As Feil, Welch and Fisher⁷ reported:

Even though the measurement of entrance and exit from the profession is a generally accepted approach to forecasting supply, minor differences in assumptions create great discrepancies over time.

Non-Physician Providers - Year 2006 Requirements

The non-physician providers analyzed in this report were the physician assistants, nurse practitioners, nurse midwives, clinical nurse specialists, social workers and psychologists. The number of these non-physician providers required to meet the needs of the Texas population and support the health care delivery system varied among the three scenarios and the different professional types (see Table 2-16). The supply of physician assistants and nurse midwives should be just about right to meet their primary care requirements in 2006. However, the supply of nurse practitioners will be slightly less than the number required.

Table 2-16. Comparison of Year 2006 Non-Physician Provider IRM3.1 Requirements and Supply Projections Using Historical Licensing Board Data.

Provider Type	IRM3.1 Scenarios 2006			TX Projected Supply from Trend Data
	SQ*	HMC	TX	
Primary Care				
Primary Care Physician Assistants	1,153	1,098	1,019	1,028
Nurse Practitioners	3,936	4,007	3,932	3,415
Certified Nurse Midwives	424	429	386	424
Mental Health				
Psychologists	5,655	5,225	4,780	8,145
Clinical Nurse Specialists **	381	352	322	816
Social Workers	5,588	5,163	4,723	11,359

Source: Health Professions Resource Center, 1999.

*SQ = Status Quo scenario; HMC = High Managed Care scenario; TX = Texas scenario

**Psychiatric/mental health/substance abuse area of practice

Based on the mixed results between requirements and supply, a close observation of psychologists, social workers and clinical nurse specialists is called for over the next few years. The analysis indicates that the supply will be approximately two times the requirements for these provider types. The model does not take into account the contribution of licensed professional counselors and marriage and family therapists. A question to be answered is whether the incorporation of these professions

into the model would result in a more appropriate requirements estimate for mental health providers.

Trends Affecting Workforce Demand

There are a number of trends that will change not only how health care is delivered but also who delivers health care.

General Population Demographics

Texas has one of the largest youth populations and one of the largest elderly populations. The health care needs of these population groups could influence demand for pediatric specialists, internal medicine physicians, orthopedists, pharmacists, and geriatricians.

Workforce Demographics

The health care workforce is aging. This can be seen in the data presented in this chapter, specifically for rural practitioners. The problem of an aging workforce has been highlighted as a core issue in the nursing shortage.

Recruitment into the health professions is being hampered by higher paying high tech jobs. The competition for younger workers is intense.

Technology

Medicine relies more and more on technology and a workforce trained to manage and operate specific equipment. For example, the Department of Labor projects that the United States will need 50,000 more radiological technicians by 2006. These types of technology specific workforce shortages may increase.

Genetic engineering holds a great deal of promise for new ways to treat acute or chronic diseases. Expansion of this technology could lead to new classifications of health care professionals and decrease the demand for certain other types of health care workers.



Workplace Environment

The health care workplace has been a very dynamic one for the past decade. The results have led to less than optimal working conditions for many health care practitioners. The work environment is one factor influencing health care workers decisions to leave their profession, while also affecting recruitment into the health professions.

Continued monitoring of the Texas health professions workforce supply and demand as well as the above environmental factors is critical if Texas is to ensure a quality health care workforce for Texas and thereby maintain quality care for its citizens.

Endnotes

1. *Physician Distribution and Health Care Challenges in Rural and Inner-City Areas*, 10th Report of the Council on Graduate Medical Education, U.S. DHHS, February 1998.
2. *Physician Work Force Strategy for Texas*, A report to the subcommittees on Health and Human Services and Education of the House Appropriations Committee. Texas Department of Health and the Texas Higher Education Coordinating Board, pg. 29, 1995.
3. *1999 AAOA Physician Assistant Census Survey for Texas*, American Academy of Physician Assistants, Alexandria, VA.
4. Peter I. Buerhaus, Douglas O. Staiger and David I. Auerbach, "Implications of an Aging Registered Nurse Workforce," *Journal of the American Medical Association*, Vo. 283, No. 22, June 14, 2000.
5. Don R. Miller, *Health and Nurses in Texas - The Supply of Registered Nurses: First Look at Available Data*, Texas Institute for Health Policy and Research and the Center for Health Economics and Policy at the University of Texas Health Science Center at San Antonio. In partnership with the Texas Nurses Foundation, Vol. 1, No. 1, Winter, 2000.

6. Donald L. Libby, *Modeling Interdisciplinary Primary Care Workforce Requirements for States: An Example from Wisconsin*, Policy Paper 96-4, June, 1996, Wisconsin Network for Health Policy Research, Madison, WI.
7. Feil, Elizabeth C., H. Gilbert Welch, Elliott S. Fisher, "Why Estimates of Physician Supply and Requirements Disagree," *Journal of the American Medical Association*, May 26, 1993, Vol. 269, No. 20, ppg. 2659 - 2663.

Sources for Health Insurance Data:

Private Insurance, 1999: The IRM3.1 national default percentage (7.8 percent) for rural managed care was used. HMO information was obtained from the Texas Department of Insurance. HMO data is collected by the HMO Service Area. The total enrollment count by HMO Service area was for 3rd quarter of 1999 (September 1999). After all other insurance distributions were determined the remaining total was the private fee for service total.

Medicaid and Medicare Enrollment, 1999. This insurance total was obtained from U.S. Health Care Financing Administration (HCFA) and the Texas Department of Health Bureau of Managed care.

Uninsured, 1999: Texas Health and Human Services Commission.

**Exhibit 2-1
Texas Population by Type of Health Insurance, 1999**

	Insurance Category	LOCATION				TEXAS TOTAL			
		URBAN		RURAL		Population	Percent of State Population Total	Total per Insurance Type	Percent of State Population
		Population	* Urban Percentage	Population	Rural Percentage				
Private Insurance	HMO only	3,485,072	20.6%	237,511	** 7.8%	3,722,583	18.6%	11,193,445	56.0%
	Fee for Service	6,176,733	36.4%	1,294,129	42.5%	7,470,862	37.4%		
Medicaid	Managed Care	400,134	2.4%	30,450	1.0%	430,584	2.2%	1,845,265	9.2%
	Fee For Service	1,151,288	6.8%	263,393	8.6%	1,414,681	7.1%		
Medicare	Managed Care	286,947	1.7%	27,405	0.9%	314,352	1.6%	2,147,868	10.7%
	Fee For Service	1,334,135	7.9%	499,381	16.4%	1,833,516	9.2%		
Uninsured		4,116,110	24.3%	692,740	22.8%	4,808,850	24.0%	4,807,672	24.0%
Total		16,950,419	100.0%	3,045,009	100.0%	19,995,428	100.0%	19,994,250	100.0%

* Percent of column total

** Estimate based on national statistics, actual Texas data not available.

